

Remarks/Arguments:

Claims 1, 16, and 19 are amended. Claims 11, 12, and 22 are canceled. Therefore, claims 1-10 and 13-21 are pending in this application.

This application is a continuation of U.S. Patent Application No. 09/646,497, which is the U.S. National Stage application of International Application No. PCT/GB99/00753, filed March 23, 1999, and claims priority to GB 9806199.7 filed March 24, 1998. Upon filing the international application, the applicants requested that the Receiving Office prepare and transmit a certified copy of the priority document to the International Bureau, who should have provided a copy to the U.S. Patent and Trademark Office. Nonetheless, in order to expedite prosecution, another certified copy of the priority document is enclosed herewith.

As requested by the Examiner, a second submission of the British Search Report dated June 12, 1998, the International Search report dated June 16, 1999, and "The Hot Spot™ Reactor" by Jenkins and Shutt are enclosed. Also enclosed is a supplemental 1449, listing only these three references, for completion by the Examiner.

I. Claim Formalities

Claim 16 is amended to correct the spelling of the words "oxidizable" and "oxidized," as noted by the Examiner. Claim 22 is canceled, so the rejection under 35 U.S.C. § 112, second paragraph, has been rendered moot. Claim 19 is amended to recite "hydrogen produced from the hydrocarbon." The applicants submit that the amendment more clearly identifies the meaning of the claim.

II. Nonobviousness

The Office Action rejects claims 1-12 and 19-21 under 35 U.S.C. § 103(a) as unpatentable over Jacobs et al. (U.S. Patent No. 5,510,056) in view of Rudy (U.S. Patent No. 5,531,972). The Office Action rejects claims 1, 3-7, 13, and 14 under 35 U.S.C. § 103(a) as unpatentable over Kleefisch et al. (U.S. Patent No. 5,980,840) in view of Rudy (U.S. Patent No. 5,531,972). The Office Action also rejects claims 13 and 15-18 under 35 U.S.C. § 103(a) as unpatentable over Jacobs et al. (U.S. Patent No. 5,510,056) in view of Rudy (U.S. Patent No. 5,531,972) as applied to claim 1, and in further view of Jenkins et al. (U.S. Patent No. 4,897,972).

In view of the present amendments to claim 1 and the arguments set forth below, the applicants submit that claims 1-10 and 13-21 are not rendered obvious by the combinations of cited references in the Office Action, but are in a condition for allowance.

Claim 1 is amended to recite "wherein the weight ratio of cerium to zirconium in the support material is from 50:50 to 99.5:0.5." Support for the upper end of this range can be found in now canceled claim 11 and at page 4, lines 8-10. Support for the lower limit of this range is found in Example 1, at page 8, line 10. Example 4 provides further support for this range. The applicants note that this situation is analogous to *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976), which is cited in MPEP § 2163.05, Section III (holding that an original specification which recited a range of 25% - 60% and specific examples of 36% and 50% provided support for a later claimed range of "between 35% and 60%"). It is noted that the weight ratio of ceria to zirconia is equivalent to the weight ratio of cerium to zirconium because both oxides are of the formula MO_2 .

The Office Action acknowledges that Jacobs et al. is silent with regard to a catalyst support including ceria having a weight ratio of ceria to zirconia from 0.5:99.5 to 99.5:0.5 or a weight ratio of ceria to zirconia from 5:95 to 95:5. Claim 1, as amended, recites a weight ratio of cerium to zirconium from 50:50 to 99.5:0.5. To form a proper obviousness rejection, the combination of references must teach each and every limitation of the claimed invention. Rudy fails to fill the void left by Jacobs et al. That is, Rudy fails to teach a weight ratio of cerium to zirconium from 50:50 to 99.5:0.5.

Rudy discloses a catalyst on a support material wherein

... the amount of ceria impregnated into the zirconia used is limited to not more than about 15 percent by weight, preferably not more than about 10 percent by weight ceria, expressed as the combined weight of the ceria and zirconia. By thus controlling the amount of ceria dispersed on the zirconia, it has been found that the adverse reaction between rhodium and ceria does not occur to any significant extent.

Col. 6, lines 38-44. Not only does Rudy fail to explicitly teach a weight ratio of cerium to zirconium from 50:50 to 99.5:0.5, but the above teaching of Rudy would not motivate one of ordinary skill in the art to increase the cerium content to above 15 percent by weight, let alone to 50 percent. In fact, the applicants submit that Rudy teaches away from a cerium content of

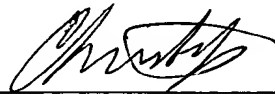
50 percent by weight because Rudy discloses that increasing the ceria content above 15 percent by weight may create an adverse reaction.

The applicants submit that the combination of Jacobs et al. and Rudy does not render the claimed invention obvious because the combination does not teach each and every limitation of the claimed invention. Further, as discussed above, Rudy teaches away from increasing the cerium content above 15 percent by weight. Therefore, one of ordinary skill would not be motivated to combine the teachings of Jacobs et al. with Rudy to develop the invention as defined by amended claim 1.

III. Conclusion

The applicants have amended or canceled certain claims to address to the pending rejections and objections. In view of the present amendments, the applicants submit that claim 1 is not rendered obvious by the cited references. Because Rudy is used in forming the remaining rejections, the applicants submit that those rejections have been overcome by the above arguments and claim amendments. The applicants therefore submit claim 1 is in a condition for allowance and request early notification to that effect. Because claims 2-10 and 13-21 depend from claim 1, they are also condition for allowance. Early notification to this effect is earnestly solicited.

Respectfully submitted,



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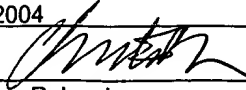
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